

# **Corona Power Loss, Electric Field, And Current Density Profiles In Bundled Horizontal And Vertical Bipolar Conductors**

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## **Summary**

In this paper, computation of the corona current and, hence, the corona power loss associated with bipolar high-voltage direct current (HVDC) conductors is presented using the finite-element method (FEM) and the method of characteristics (MOC). The former method is used to solve Poisson's equation while the latter is used to satisfy the current continuity condition. The ground-plane current density and electric field profiles associated with the HVDC conductors are also calculated as a prerequisite for the computation of the corona current. The effectiveness of the present method is demonstrated using HVDC full-scale and laboratory-model transmission lines. Horizontal and vertical bipolar configurations are tested with 2 and 4 bundles. Comparison between previously measured and computed profiles and present calculations shows satisfactory agreement with previous measured and calculated values.

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